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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/720,122	11/25/2003	Toshio Tsujimoto	245926US0XDIV	4386
22850	7590	10/16/2007		
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			EXAMINER SONG, MATTHEW J	
			ART UNIT 1792	PAPER NUMBER
			NOTIFICATION DATE 10/16/2007	DELIVERY MODE ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/720,122	Applicant(s) TSUJIMOTO ET AL.	
	Examiner Matthew J. Song	Art Unit 1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 August 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 14-16, 18, 19 and 21-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 14-16, 18-19, and 21-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 7/2/2007 has been entered.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 14-16, 18-19, and 21-26 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 14 recites, "an amount of said crystallization promoter is equal to or more than 1×10^{-9} to less than 1×10^{-8} mol/cm² being calculated as metal oxide" in the last two lines. There is no support in the original disclosure for the claimed range. At best, the original disclosure merely teaches 3.9×10^{-9} , 5.2×10^{-9} , and 6.5×10^{-9} , as calculated on page 7 of the remarks

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filed 7/2/2007. These three data points do not provide support for the range, only support for the specific value. It is noted that the endpoints of 1×10^{-9} and 1×10^{-8} are clearly not supported.

Claims 15-16, 18-19, and 21-26 are rejected because these claims depend from claim 14.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 25 recites the limitation "the polysilicon" in line 3. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 14-16, 18-19, and 21-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hansen et al (US 5,980,629) in view of Watanabe et al (US 6,106,610).

In a method of forming a crucible for production of silicon single crystals, note entire reference, Hansen et al teaches a crucible has inner and outer coatings of a devitrification promoter (col 3, ln 1-50 and col 4, ln 40-55). Hansen et al also teaches granular polycrystalline silicon is loaded into the crucible (col 3, ln 50-67) and the devitrification promoter is preferably barium, magnesium, strontium or beryllium (col 6, ln 20-5). Hansen et al also teaches devitrification promoters includes metal oxides, carbonates, oxalates and ion pairs of a metal cation and organic anions (col 6, ln 1-65), this clearly suggests applicant's metal salts, metal organic acid salt, and barium carbonate.

Hansen et al does not teach the crystallization promoter is dispersed in a silica matrix. Hansen et al is not particular about the method used to coat the surface of the crucible.

In a method of forming a crucible, note entire reference, Watanabe et al teaches a crystallization promoter can be used either alone or as a mixture with a powder of synthetic silicon dioxide to form a translucent quartz glass layer. Watanabe et al teaches depositing a synthetic silicon dioxide powder sufficiently impregnated with the aqueous solution, and the layer is formed as a coated film or a solid solution layer on the surface (col 3, ln 30-65 and col 4, ln 1-35), this reads on applicant's crystallization promoter dispersed in a silica matrix. Watanabe et al also teaches a crystallization promoter layer is fused to a base body (col 5, ln 5-30). Watanabe et al also teaches a transparent internal quartz layer (col 5, ln 55-67).

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It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Hansen et al by fusing the layer with a crystallization promoter dispersed in a silica matrix to the base body as taught by Watanabe et al to improve adherence and improve safety by reducing the risk of inhalation and ingestion of the promoter ('629 col 8, ln 10-35).

Referring to claim 14, the combination of Hansen et al and Watanabe et al teaches a concentration of 1×10^{-5} to 1×10^{-8} M/cm² ('610 claims 3 and 11). A prima facie case of obviousness exists when the claimed range and the prior art range do not overlap but are close enough such that one skilled in the art would have expected them to produce products having the same properties. Titanium metal Corp. Am v Banner, 778 F.2d 775, 783, 227 USPQ 773, 779 (Fed. Cir. 1985). Here, it is expected that a concentration of 0.9999999×10^{-8} M/cm², which is within the claimed range, would be expected to produce products having the same properties when using 1×10^{-8} M/cm².

Referring to claim 15, the combination of Hansen et al and Watanabe et al does not disclose the claimed method of obtaining the crucible using a partial hydrolyzate of alkoxysilane oligomer, which is a product-by-process claim and the patentability determination of a product-by-process claim is based on the patentability of the product and does not depend on its method of production (MPEP 2113). The combination of Hansen et al and Watanabe et al teaches a crucible, which meets all of the claimed product limitations of claim 15. The same arguments apply for claims 16 and 18-20, which specify the liquid used to obtain the crystallization promoter layer.

Referring to claims 21-26, the combination of Hansen et al and Watanabe et al teaches a crystallization promoter layer **24, 26** on the inside and outside surfaces of the crucible and polysilicon in the crucible. ('629 Fig 1 and col 12, ln 25-35).

Response to Arguments

8. Applicant's arguments with respect to claims 14-16, 18-19, and 21-26 have been considered but are moot in view of the new ground(s) of rejection.

9. Applicant's arguments filed 7/2/2007 have been fully considered but they are not persuasive.

Applicant's argument that Watanabe teaches away from the claimed invention is noted but not found persuasive. Applicant alleges that Watanabe teaches an internal layer of silicon dioxide covering the crystallization promoter containing layer to prevent direct contact of the crystallization promoter with the polysilicon, thus teaches away from a promoter containing inner layer in direct contact with the polysilicon. Hansen is relied upon to teach an crystallization promoter containing inner layer **26** which is in direct contact with a polysilicon material (Fig 1 and col 12, ln 25-35). Watanabe is merely relied upon to teach an improved method of forming a crystallization promoter layer by dispersing the promoter in a silica matrix. The fact that Watanabe teaches a further improvement of forming an additional inner layer is not a teaching away. It is noted that non-preferred embodiments constitute prior art and preferred embodiments do not constitute a teaching away from a broader disclosure or nonpreferred embodiments (MPEP 2123). The crystallization promoter layer on an inner surface in direct contact with polysilicon is known in the art, as evidenced by Hansen. The mere disclosure of Watanabe which

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teaches an additional improvement does not teach away from that which was already known in the prior art.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew J. Song whose telephone number is 571-272-1468. The examiner can normally be reached on M-F 9:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on 571-272-1414. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Matthew J Song
Examiner
Art Unit 1792

MJS
October 10, 2007

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*/Robert Kunemund/
Robert Kunemund
Primary Examiner
TC 1700*